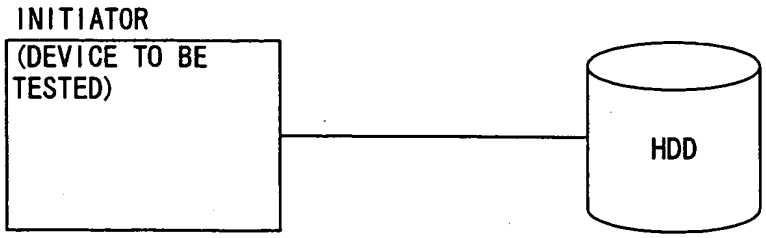

FIG. 1A

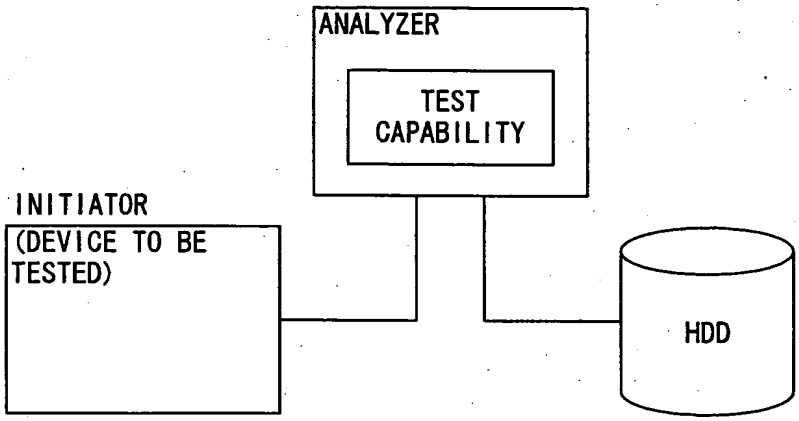

FIG. 1B

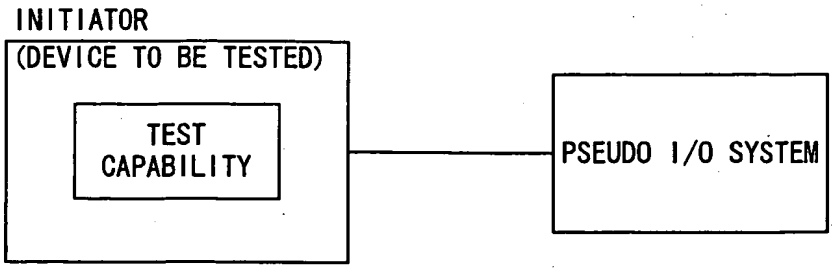

FIG. 1C

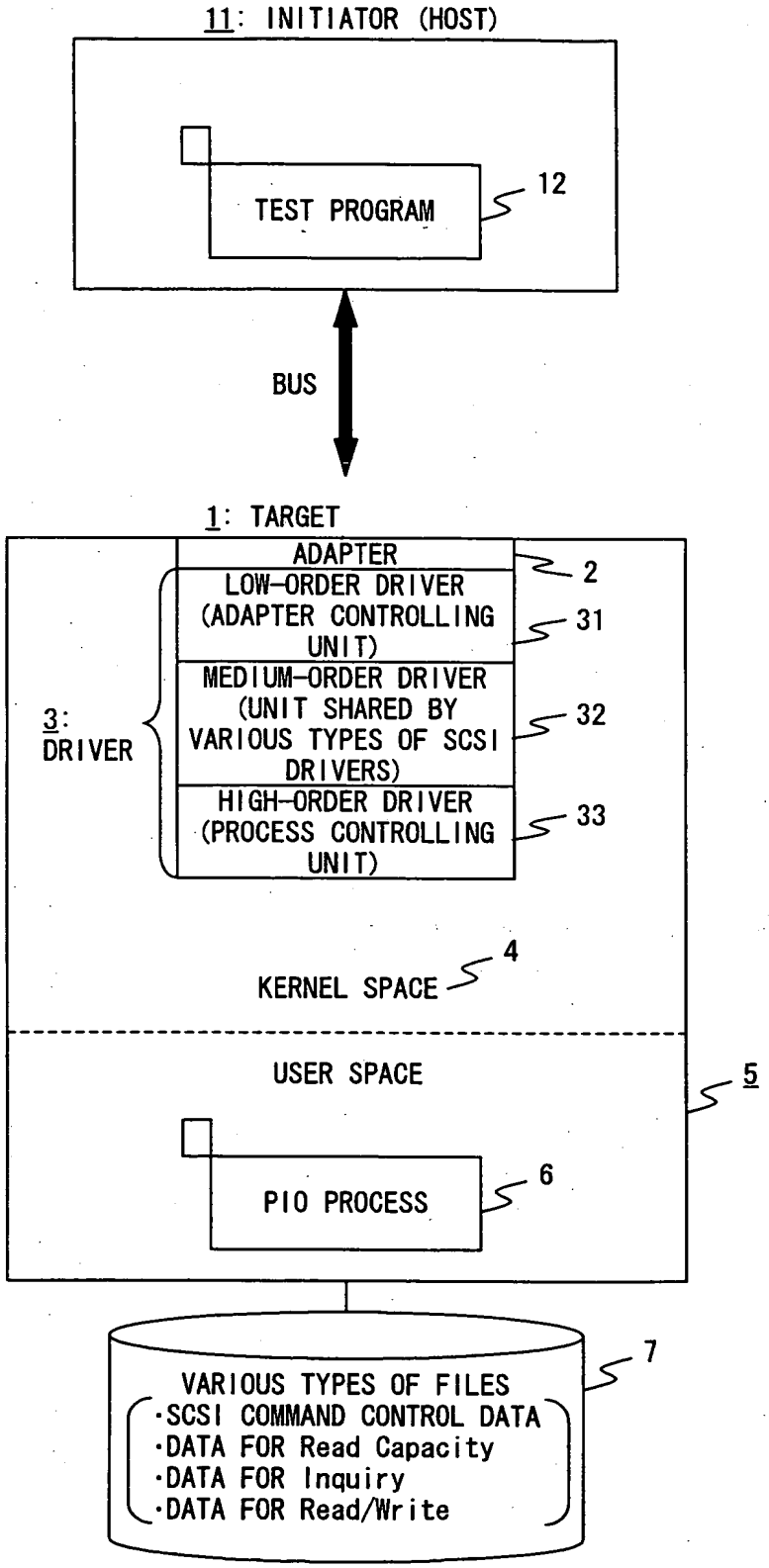
11: INITIATOR (HOST)
TEST PROGRAM
12
BUS
1: TARGET
ADAPTER
2
LOW-ORDER DRIVER (ADAPTER CONTROLLING UNIT)
31
MEDIUM-ORDER DRIVER (UNIT SHARED BY VARIOUS TYPES OF SCSI DRIVERS)
32
HIGH-ORDER DRIVER (PROCESS CONTROLLING UNIT)
33
3: DRIVER
4
KERNEL SPACE
USER SPACE
5
PIO PROCESS
6
7
VARIOUS TYPES OF FILES
·SCSI COMMAND CONTROL DATA
·DATA FOR Read Capacity
·DATA FOR Inquiry
·DATA FOR Read/Write

FIG. 2

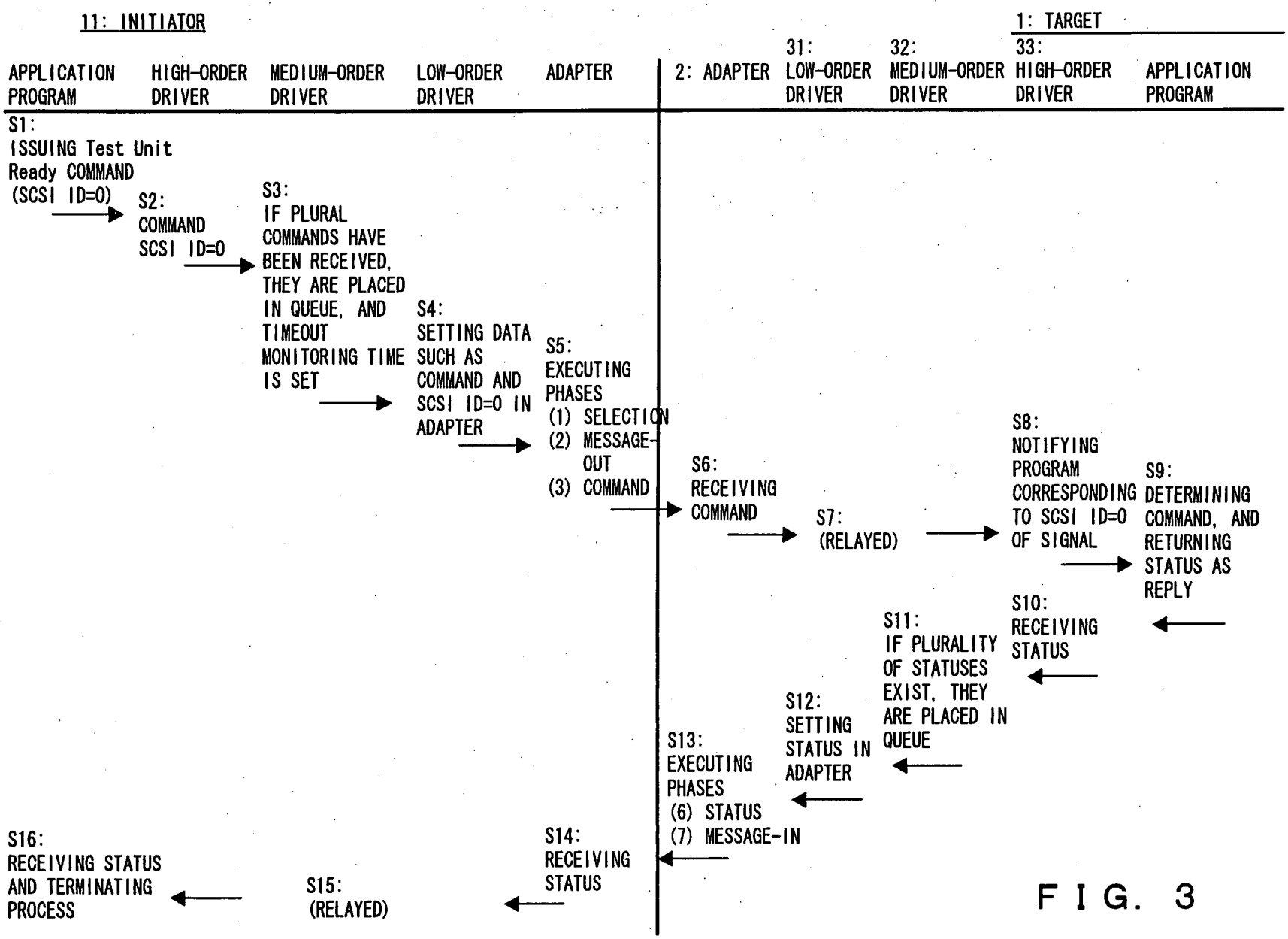
11: INITIATOR
1: TARGET
APPLICATION PROGRAM
HIGH-ORDER DRIVER
MEDIUM-ORDER DRIVER
LOW-ORDER DRIVER
ADAPTER
2: ADAPTER
31: LOW-ORDER DRIVER
32: MEDIUM-ORDER DRIVER
33: HIGH-ORDER DRIVER
APPLICATION PROGRAM
S1: ISSUING Test Unit Ready COMMAND (SCSI ID=0)
S2: COMMAND SCSI ID=0
S3: IF PLURAL COMMANDS HAVE BEEN RECEIVED, THEY ARE PLACED IN QUEUE, AND TIMEOUT MONITORING TIME IS SET
S4: SETTING DATA SUCH AS COMMAND AND SCSI ID=0 IN ADAPTER
S5: EXECUTING PHASES (1) SELECTION (2) MESSAGE-OUT (3) COMMAND
S6: RECEIVING COMMAND
S7: (RELAYED)
S8: NOTIFYING PROGRAM CORRESPONDING TO SCSI ID=0 OF SIGNAL
S9: DETERMINING COMMAND, AND RETURNING STATUS AS REPLY
S10: RECEIVING STATUS
S11: IF PLURALITY OF STATUSES EXIST, THEY ARE PLACED IN QUEUE
S12: SETTING STATUS IN ADAPTER
S13: EXECUTING PHASES (6) STATUS (7) MESSAGE-IN
S14: RECEIVING STATUS
S15: (RELAYED)
S16: RECEIVING STATUS AND TERMINATING PROCESS

FIG. 3

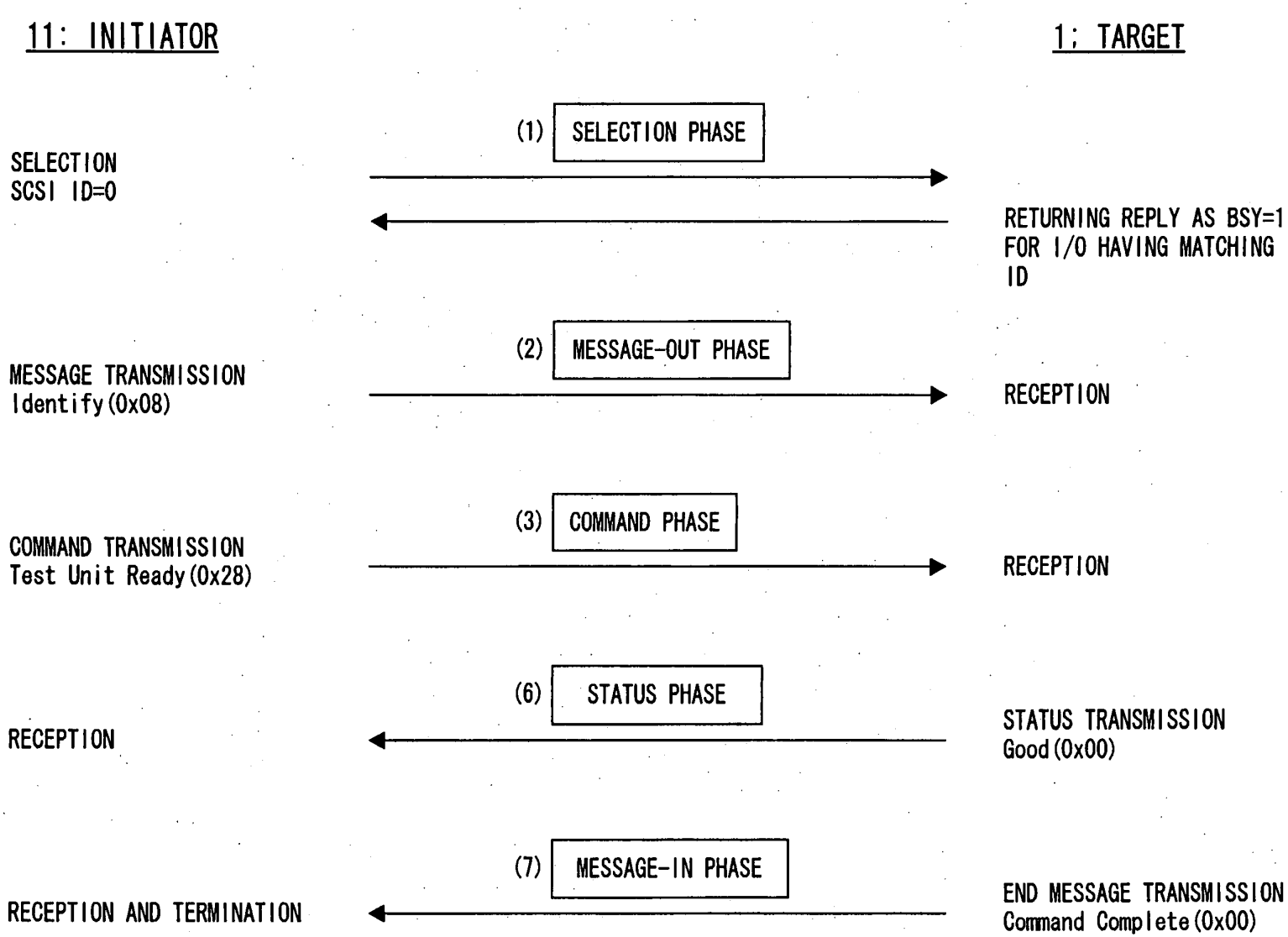
11: INITIATOR
1: TARGET
(1) SELECTION PHASE
SELECTION
SCSI ID=0
RETURNING REPLY AS BSY=1
FOR I/O HAVING MATCHING
ID
(2) MESSAGE-OUT PHASE
MESSAGE TRANSMISSION
Identify(0x08)
RECEPTION
(3) COMMAND PHASE
COMMAND TRANSMISSION
Test Unit Ready(0x28)
RECEPTION
(6) STATUS PHASE
RECEPTION
STATUS TRANSMISSION
Good(0x00)
(7) MESSAGE-IN PHASE
RECEPTION AND TERMINATION
END MESSAGE TRANSMISSION
Command Complete(0x00)

FIG. 4

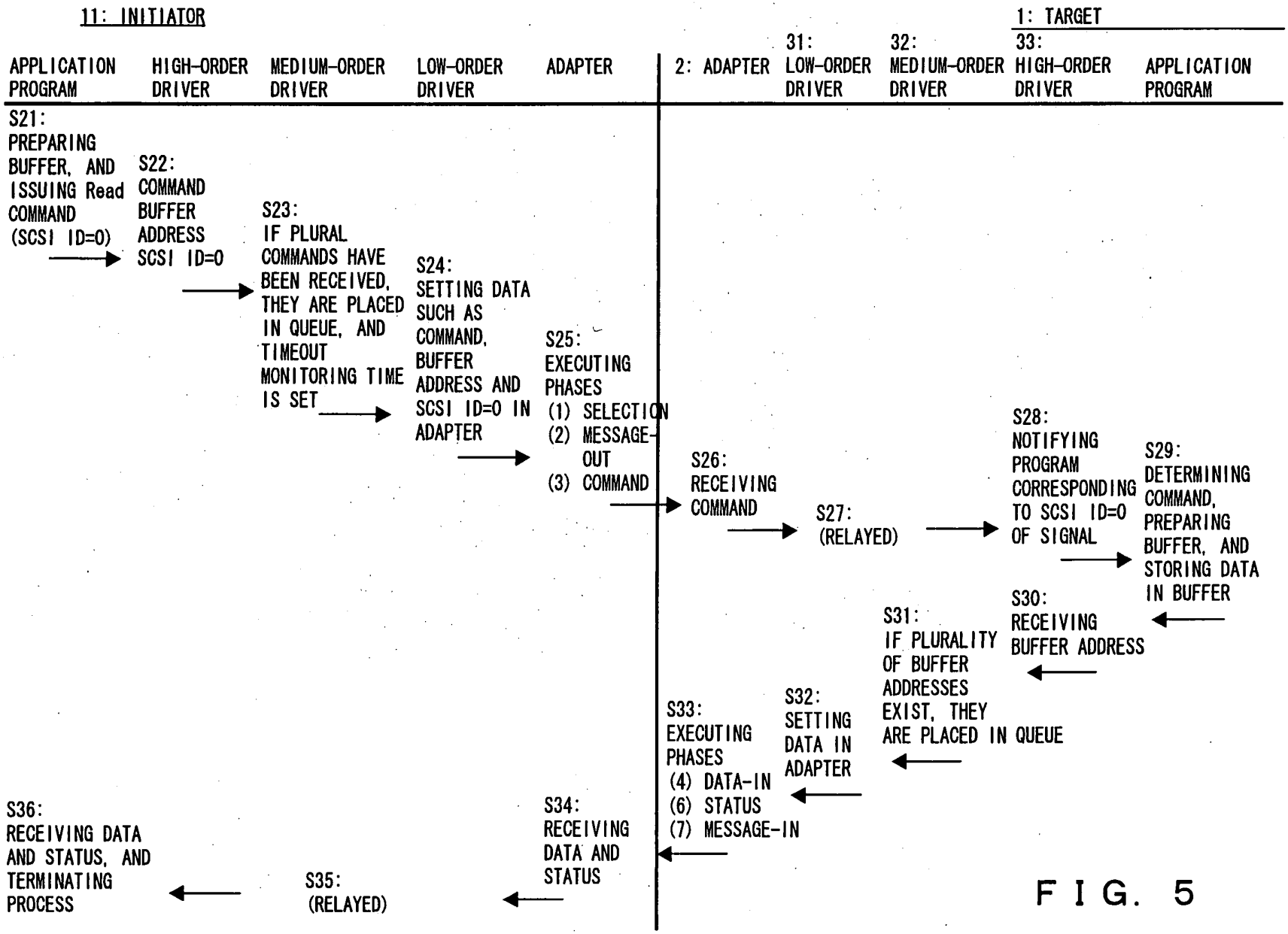

FIG. 5

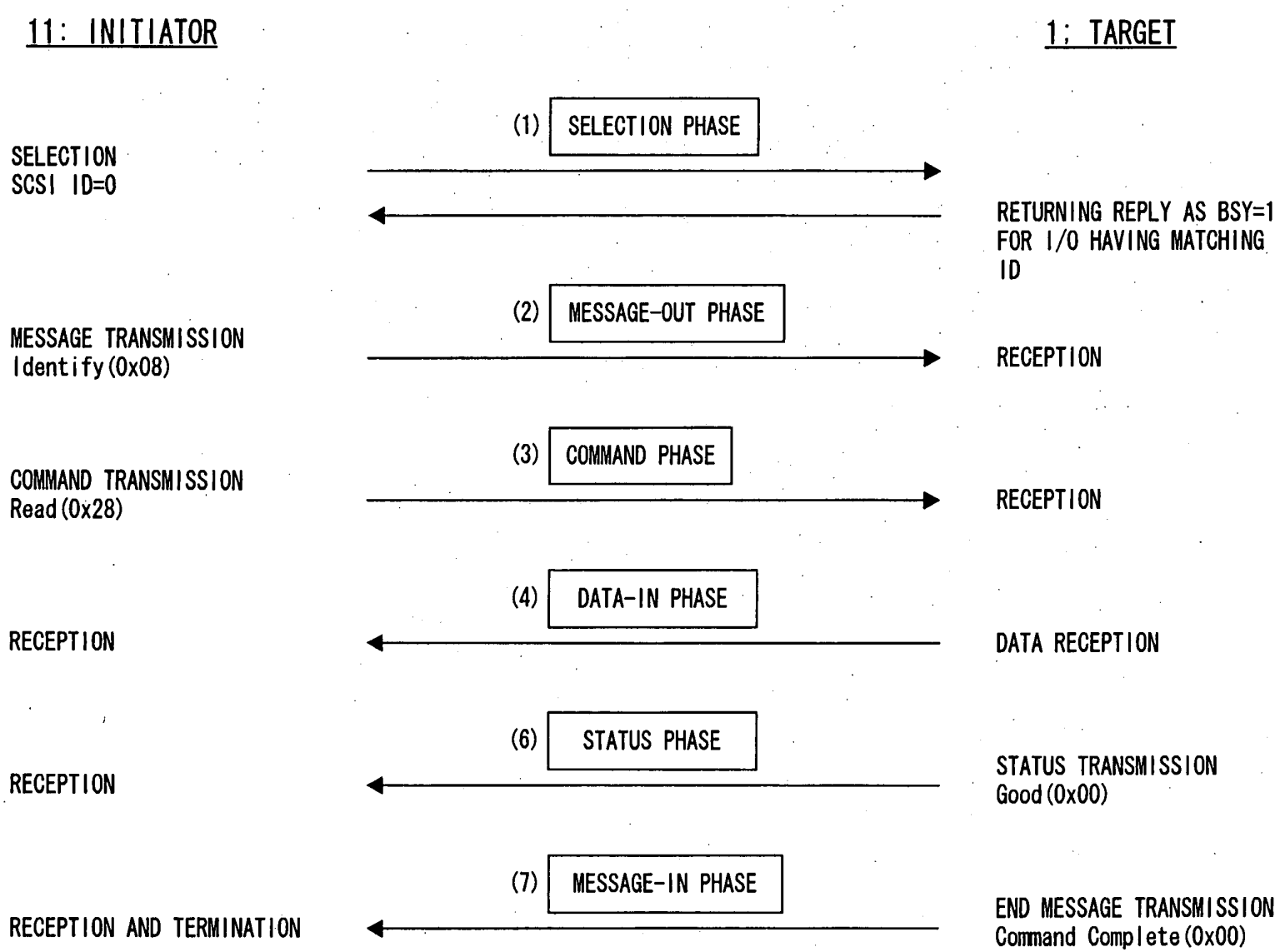
11: INITIATOR
1: TARGET
(1) SELECTION PHASE
SELECTION
SCSI ID=0
RETURNING REPLY AS BSY=1
FOR I/O HAVING MATCHING
ID
(2) MESSAGE-OUT PHASE
MESSAGE TRANSMISSION
Identify(0x08)
RECEPTION
(3) COMMAND PHASE
COMMAND TRANSMISSION
Read(0x28)
RECEPTION
(4) DATA-IN PHASE
RECEPTION
DATA RECEPTION
(6) STATUS PHASE
RECEPTION
STATUS TRANSMISSION
Good(0x00)
(7) MESSAGE-IN PHASE
RECEPTION AND TERMINATION
END MESSAGE TRANSMISSION
Command Complete(0x00)

FIG. 6

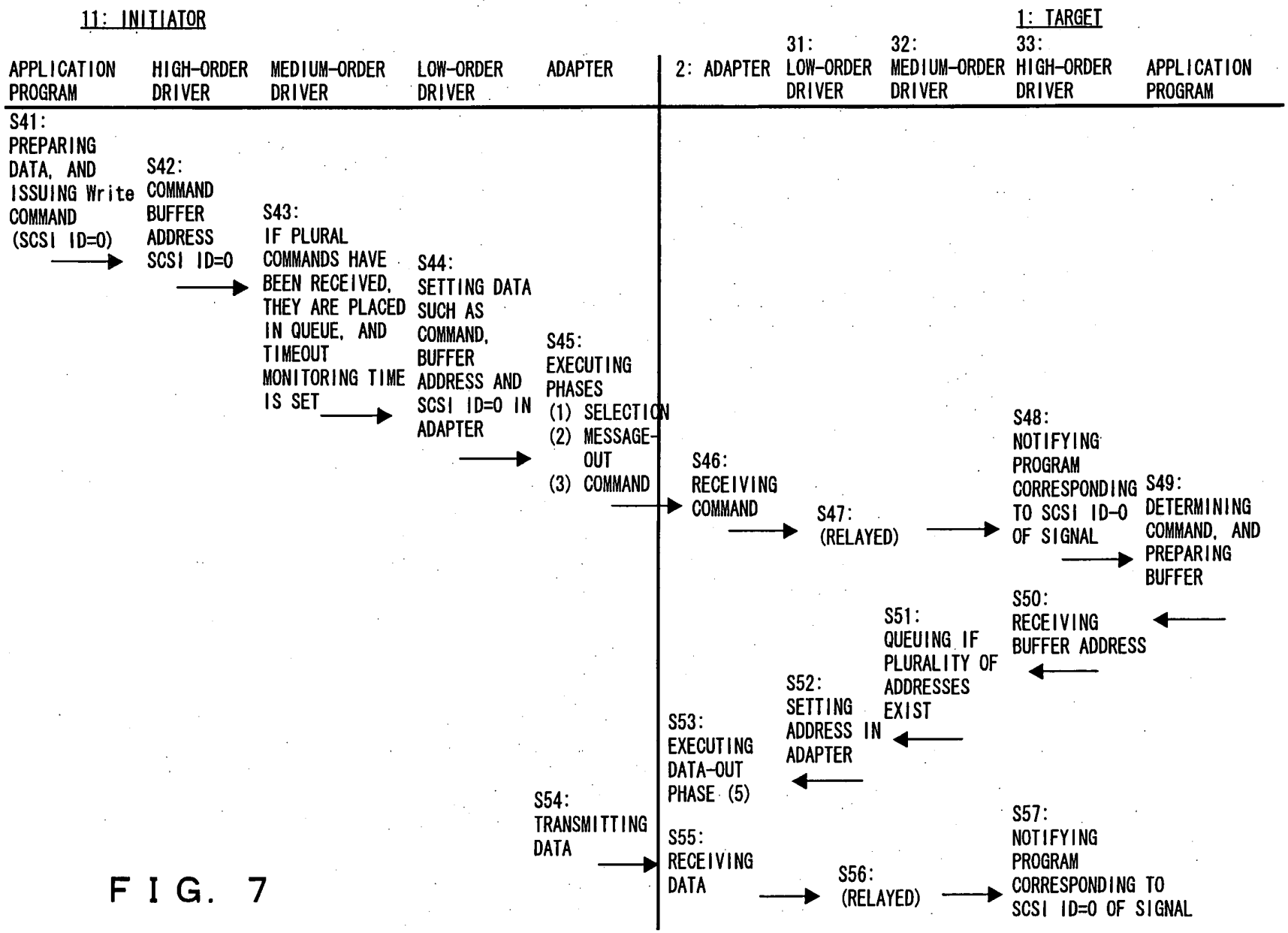
11: INITIATOR
1: TARGET
APPLICATION PROGRAM
HIGH-ORDER DRIVER
MEDIUM-ORDER DRIVER
LOW-ORDER DRIVER
ADAPTER
2: ADAPTER
31: LOW-ORDER DRIVER
32: MEDIUM-ORDER DRIVER
33: HIGH-ORDER DRIVER
APPLICATION PROGRAM
S41: PREPARING DATA, AND ISSUING Write COMMAND (SCSI ID=0)
S42: COMMAND BUFFER ADDRESS SCSI ID=0
S43: IF PLURAL COMMANDS HAVE BEEN RECEIVED, THEY ARE PLACED IN QUEUE, AND TIMEOUT MONITORING TIME IS SET
S44: SETTING DATA SUCH AS COMMAND, BUFFER ADDRESS AND SCSI ID=0 IN ADAPTER
S45: EXECUTING PHASES (1) SELECTION (2) MESSAGE-OUT (3) COMMAND
S46: RECEIVING COMMAND
S47: (RELAYED)
S48: NOTIFYING PROGRAM CORRESPONDING TO SCSI ID-0 OF SIGNAL
S49: DETERMINING COMMAND, AND PREPARING BUFFER
S50: RECEIVING BUFFER ADDRESS
S51: QUEUING IF PLURALITY OF ADDRESSES EXIST
S52: SETTING ADDRESS IN ADAPTER
S53: EXECUTING DATA-OUT PHASE (5)
S54: TRANSMITTING DATA
S55: RECEIVING DATA
S56: (RELAYED)
S57: NOTIFYING PROGRAM CORRESPONDING TO SCSI ID=0 OF SIGNAL

FIG. 7

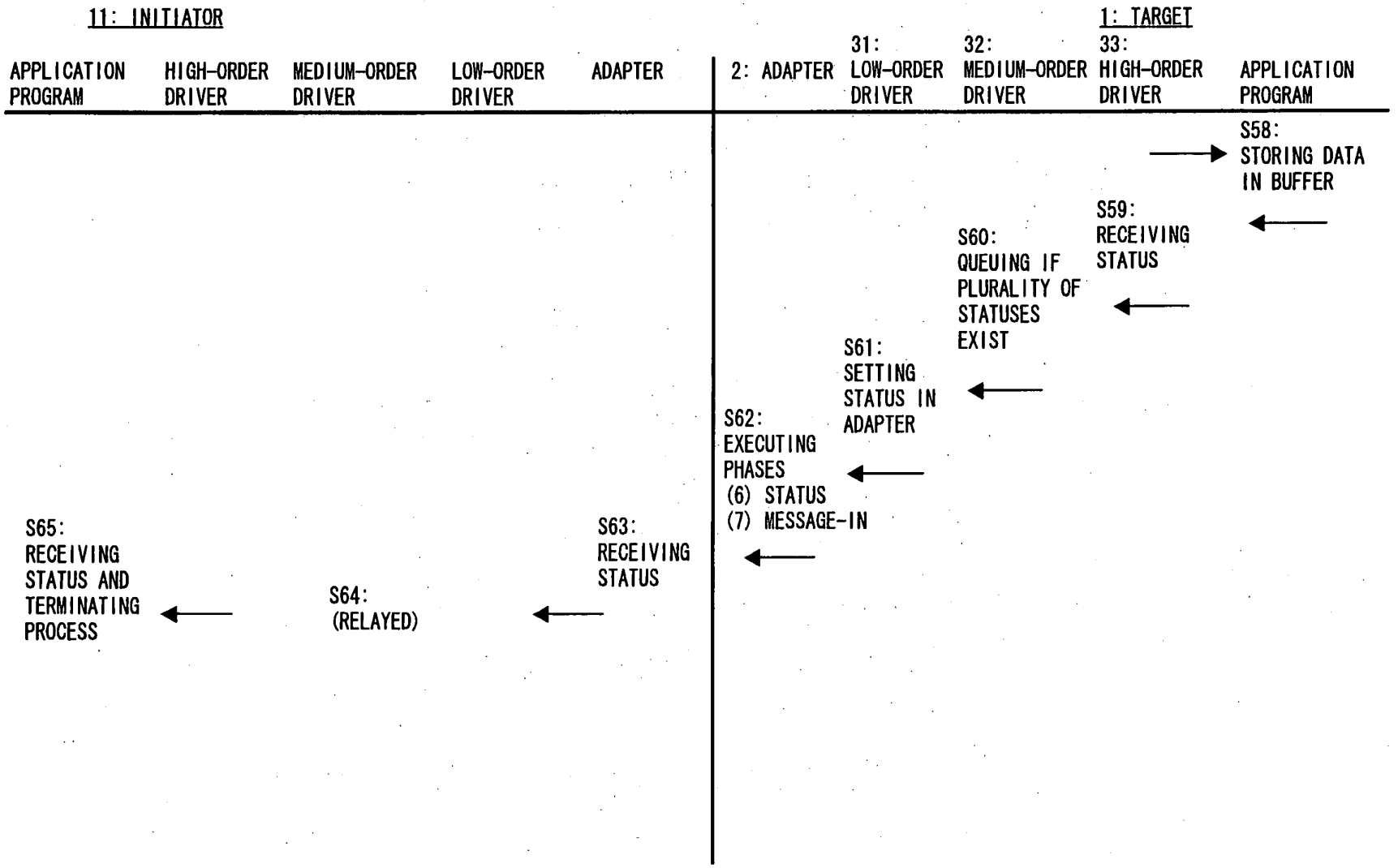
11: INITIATOR
APPLICATION PROGRAM
HIGH-ORDER DRIVER
MEDIUM-ORDER DRIVER
LOW-ORDER DRIVER
ADAPTER
2: ADAPTER
31: LOW-ORDER DRIVER
32: MEDIUM-ORDER DRIVER
1: TARGET
33: HIGH-ORDER DRIVER
APPLICATION PROGRAM
S58: STORING DATA IN BUFFER
S59: RECEIVING STATUS
S60: QUEUING IF PLURALITY OF STATUSES EXIST
S61: SETTING STATUS IN ADAPTER
S62: EXECUTING PHASES (6) STATUS (7) MESSAGE-IN
S63: RECEIVING STATUS
S64: (RELAYED)
S65: RECEIVING STATUS AND TERMINATING PROCESS

FIG. 8

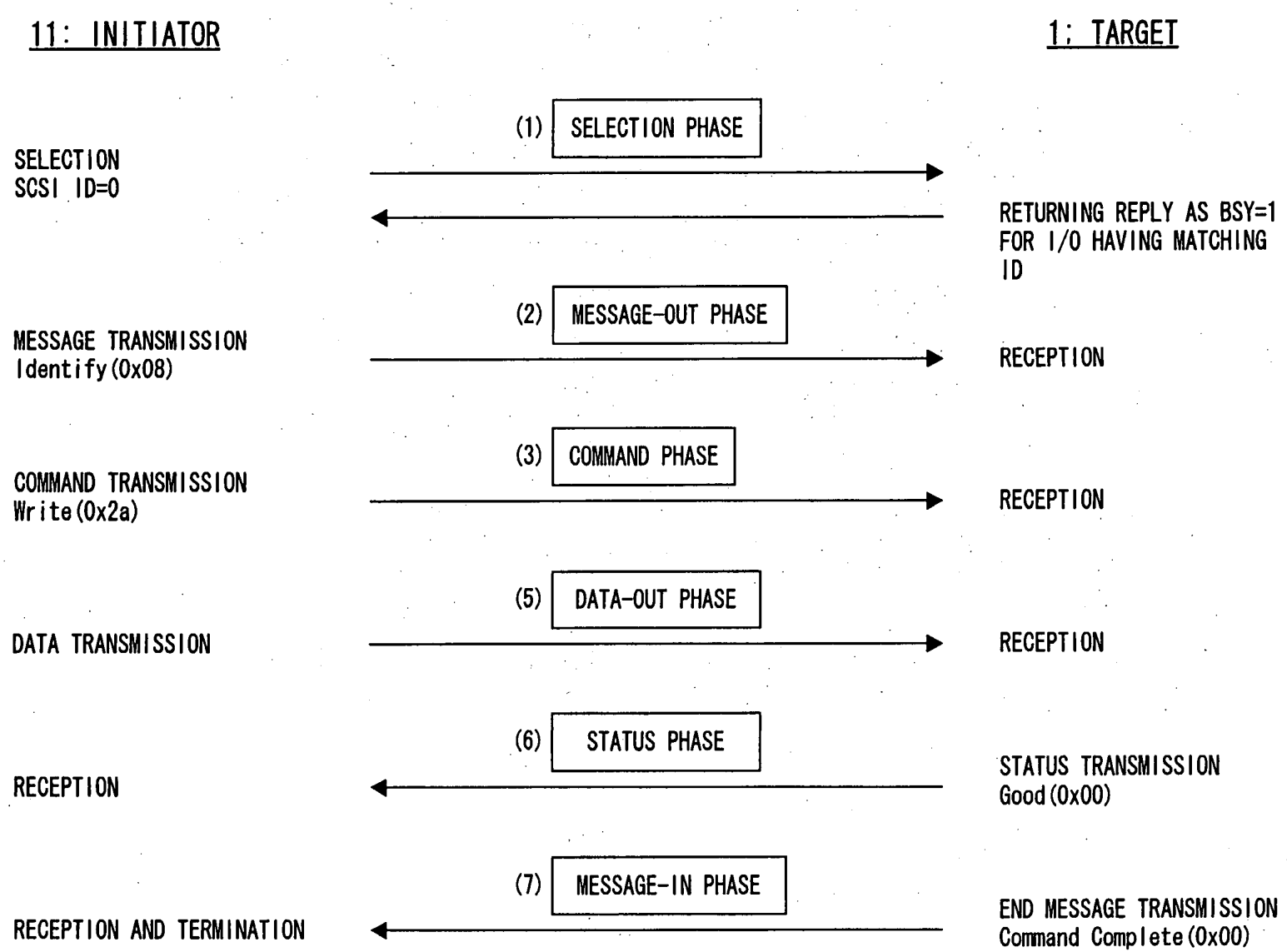
11: INITIATOR
1: TARGET
(1) SELECTION PHASE
SELECTION
SCSI ID=0
RETURNING REPLY AS BSY=1
FOR I/O HAVING MATCHING
ID
(2) MESSAGE-OUT PHASE
MESSAGE TRANSMISSION
Identify(0x08)
RECEPTION
(3) COMMAND PHASE
COMMAND TRANSMISSION
Write(0x2a)
RECEPTION
(5) DATA-OUT PHASE
DATA TRANSMISSION
RECEPTION
(6) STATUS PHASE
RECEPTION
STATUS TRANSMISSION
Good(0x00)
(7) MESSAGE-IN PHASE
RECEPTION AND TERMINATION
END MESSAGE TRANSMISSION
Command Complete(0x00)

FIG. 9

(a) EXAMPLE OF ENCAPSULATION USING FC PROTOCOL
FRAME (Frame Format)

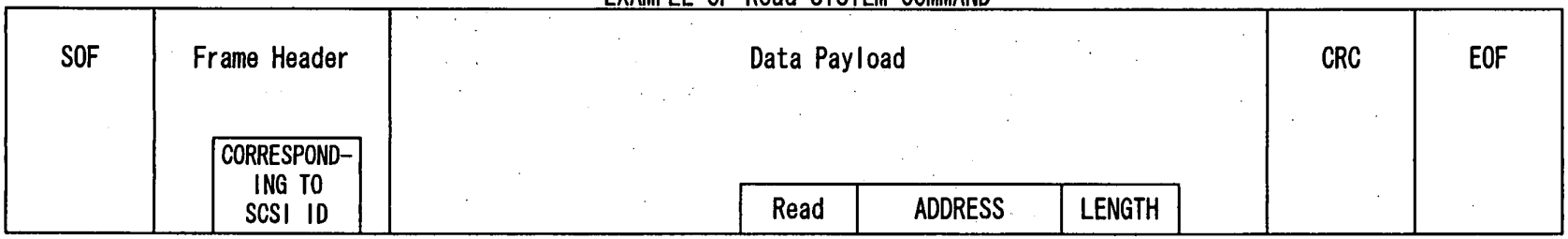

FIG. 10A

(b) EXAMPLE OF ENCAPSULATION USING iSCSI PROTOCOL
DATA FORMAT

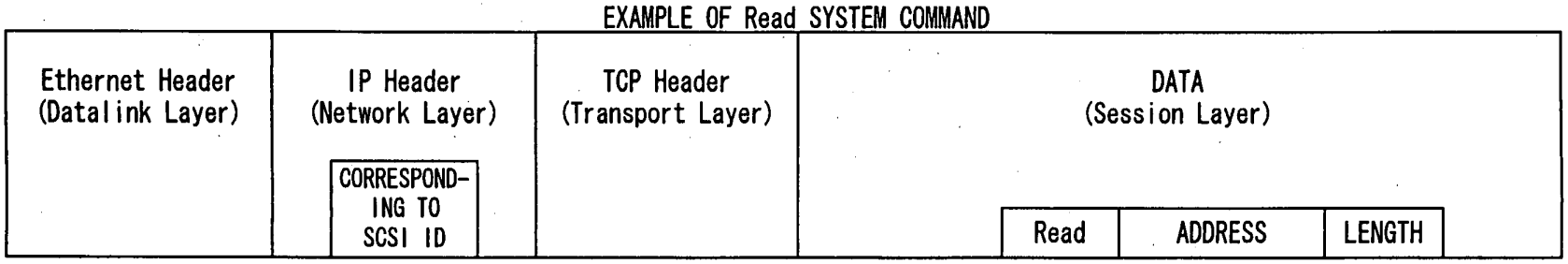

FIG. 10B

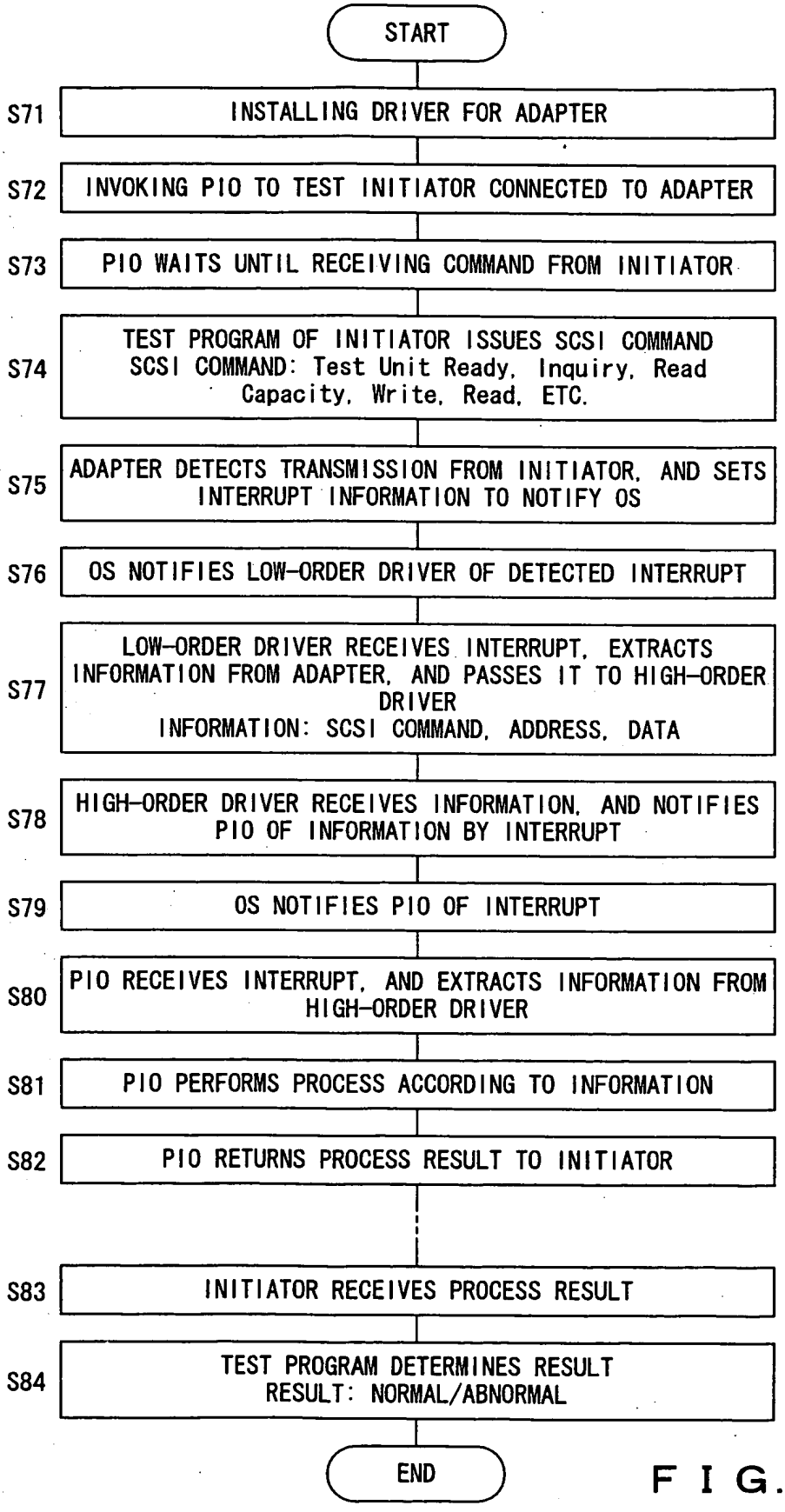
START
S71
INSTALLING DRIVER FOR ADAPTER
S72
INVOKING PIO TO TEST INITIATOR CONNECTED TO ADAPTER
S73
PIO WAITS UNTIL RECEIVING COMMAND FROM INITIATOR
S74
TEST PROGRAM OF INITIATOR ISSUES SCSI COMMAND
SCSI COMMAND: Test Unit Ready, Inquiry, Read Capacity, Write, Read, ETC.
S75
ADAPTER DETECTS TRANSMISSION FROM INITIATOR, AND SETS INTERRUPT INFORMATION TO NOTIFY OS
S76
OS NOTIFIES LOW-ORDER DRIVER OF DETECTED INTERRUPT
S77
LOW-ORDER DRIVER RECEIVES INTERRUPT, EXTRACTS INFORMATION FROM ADAPTER, AND PASSES IT TO HIGH-ORDER DRIVER
INFORMATION: SCSI COMMAND, ADDRESS, DATA
S78
HIGH-ORDER DRIVER RECEIVES INFORMATION, AND NOTIFIES PIO OF INFORMATION BY INTERRUPT
S79
OS NOTIFIES PIO OF INTERRUPT
S80
PIO RECEIVES INTERRUPT, AND EXTRACTS INFORMATION FROM HIGH-ORDER DRIVER
S81
PIO PERFORMS PROCESS ACCORDING TO INFORMATION
S82
PIO RETURNS PROCESS RESULT TO INITIATOR
S83
INITIATOR RECEIVES PROCESS RESULT
S84
TEST PROGRAM DETERMINES RESULT
RESULT: NORMAL/ABNORMAL
END

FIG. 11

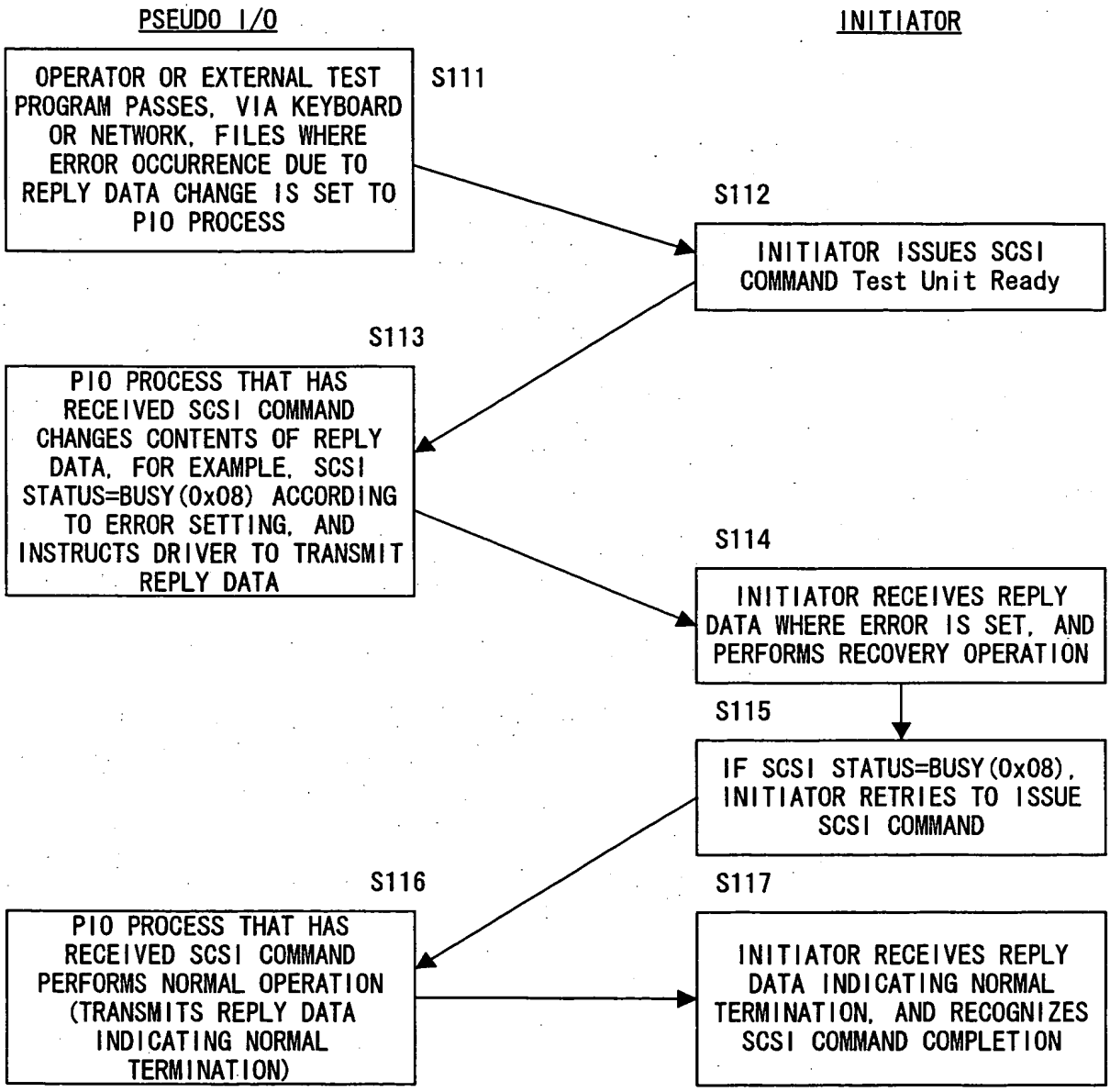

FIG. 12

FIG. 13A

PROCESS SETTING FILE			
COMMAND	VALID/INVALID	ACTION	ERROR FILE
TEST UNIT READY	VALID	Control SYSTEM	error_file 1

FIG. 13B

ERROR SETTING FILE (error_file 1)	
TIMING	ERROR CONTENTS
WHEN REPLY DATA IS RETURNED	REPLY DATA CHANGE (EX: GOOD (0x00) → BUSY (0x08)

FIG. 13C

INITIATOR SCSI COMMAND	
COMMAND	CONTENTS
TEST UNIT READY	00 00 00 00 00 00

FIG. 13D

STATUS	
STATUS	VALUE
GOOD	0
BUSY	8

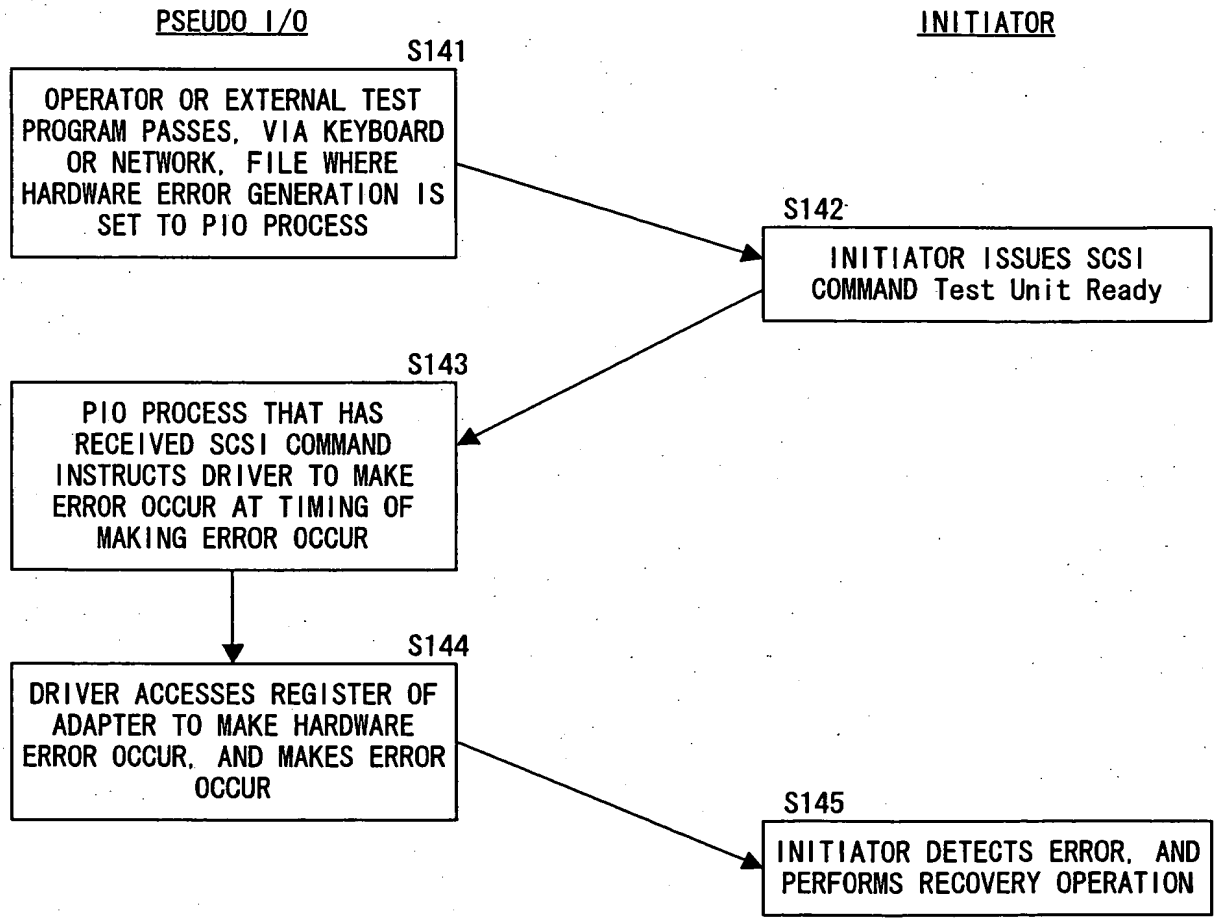

FIG. 14

FIG. 15A

PROCESS SETTING FILE			
COMMAND	VALID/INVALID	ACTION	ERROR FILE
TEST UNIT READY	VALID	Control SYSTEM	error_file 10

FIG. 15B

ERROR SETTING FILE (error_file 10)	
TIMING	ERROR CONTENTS
WHEN REPLY DATA IS RETURNED	FAULT IS MADE TO OCCUR IN SIGNAL TRANSMITTED OVER CABLE (EX: GENERATING Link Failure)

FIG. 15C

INITIATOR SCSI COMMAND	
COMMAND	CONTENTS
TEST UNIT READY	00 00 00 00 00 00

FIG. 15D

STATUS	
STATUS	VALUE
GOOD	0
BUSY	8

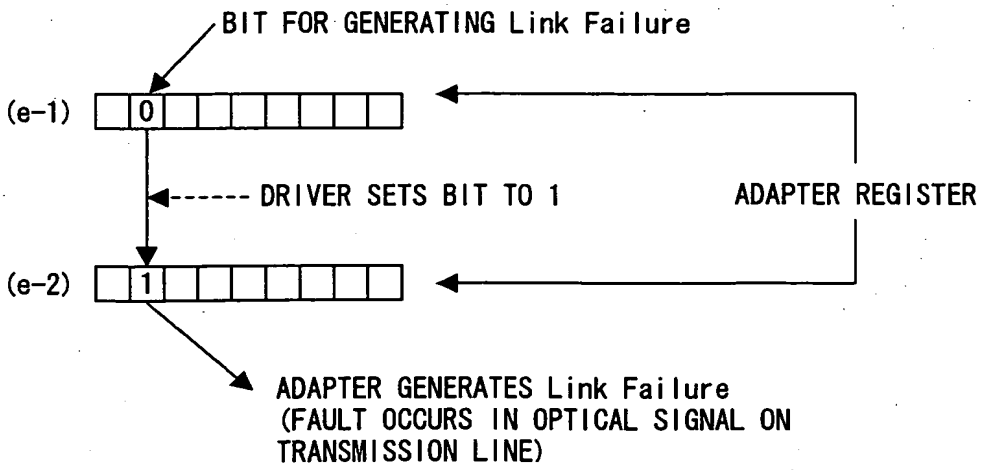

FIG. 15E